UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

MAY 0 8 2013

CERTIFIED MAIL 7012 1010 0001 8097 4298
RETURN RECEIPT REQUESTED

City of Durham
Attn: Mr. Tom Lucas
Superintendent, Water and Sewer Maintenance Division
1100 Martin Luther King Jr. Parkway
Durham, North Carolina 27707

Re: U.S. Environmental Protection Agency and North Carolina Department of Environment and Natural Resources Compliance Evaluation Inspection
Notice of Opportunity to Show Cause
National Pollutant Discharge Elimination System Permit Nos.:
NC0023841, NC0047597
Durham North Wastewater Treatment Plant and South Wastewater Treatment Plant

Dear Mr. Lucas:

On August 5, 2011, the U.S. Environmental Protection Agency, Region 4 sent an Information Request Letter pursuant to Section 308 of the Clean Water Act (CWA), 33 U.S.C. § 1318, to the City of Durham (the City) requesting information related to Sanitary Sewer Overflows (SSOs) from the sewer system. On October 23 – 25, 2012, the EPA and the North Carolina Department of Environment and Natural Resources (NCDENR) conducted a Compliance Evaluation Inspection (CEI) of the City's Wastewater Collection and Transmission System (WCTS) associated with the Durham North Wastewater Treatment Plant (WWTP) and South WWTP owned and operated by the City. The inspection results are summarized in the enclosed CEI report. As a result of the City's response to the Information Request Letter and the information gathered pursuant to the aforementioned on-site inspections, the EPA has concluded that the City is in violation of the CWA and or the City's National Pollutant Discharge Elimination System Permit (NPDES) permit, including the following violations:

1. The City has allowed at least 249 SSOs to occur from April 2008 through April 2013, totaling at least 1,614,657 gallons of untreated sewage that discharged from the City's WCTS. At least 241 of those SSOs were reported to have directly or indirectly affected waters of the U.S. in violation of the CWA and/or in violation of Parts II.B.2 (Duty to Mitigate) and II.C.2 (Proper Operation, Maintenance and Replacement) of the City's NPDES permits, issued to the City by NCDENR.

2. The City has failed to adequately operate and maintain the pump stations as required by Parts II.B.2 and II.C.2 of the City's NPDES permits.

Such violations are subject to enforcement action pursuant to Section 309 of the CWA, 33 U.S.C. § 1319. This Section provides for the issuance of compliance orders, administrative actions to assess penalties and/or the initiation of civil or criminal actions. Therefore, this Agency requests that representatives of the City be present in this office to show cause of why the EPA should not take formal enforcement action against the City in connection with the violations listed above, including the assessment of appropriate civil penalties. In lieu of appearing in the EPA's offices for this meeting, a telephone conference may be scheduled. The representatives should be prepared to provide all relevant information with documentation, pertaining to the above violations including, but not limited to, any financial information, which may reflect your ability to pay a penalty. You have the right to be represented by legal counsel. The EPA may consider information provided during the meeting or telephone conference in any enforcement proceeding related to this matter.

Please contact Ms. Sara Schiff, of my staff, at (404) 562-9870 or via email at Schiff.Sara@epa.gov within seven days to confirm your receipt of this letter and to set up a date and time for the meeting. If you have any questions regarding this matter, please contact Ms. Schiff.

Sincerely,

James D. Giattina
Director
Water Protection Division

Enclosures

cc: Mr. Jeff Poupart
North Carolina Department of Environmental and Natural Resources

Ms. Deborah Gore
North Carolina Department of Environmental and Natural Resources

U.S. Environmental Protection Agency
Office of Compliance and Enforcement
1200 Pennsylvania Avenue, NW
Washington, DC 20460

U.S. Environmental Protection Agency, Region 4
61 Forsyth St SW
Atlanta, GA 30303

SANITARY SEWER SYSTEM COMPLIANCE INSPECTION

CITY OF DURHAM, NORTH CAROLINA

INSPECTION REPORT

Inspection Dates:

October 23 - 25, 2012

Report Date: April 23, 2013

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LIST OF APPENDICES

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I. INTRODUCTION

On October 23-25, 2012 the U.S. Environmental Protection Agency (EPA) with assistance from PG Environmental, LLC (PG), a U.S. EPA contractor, inspected the City of Durham's (City) wastewater collection system. The EPA Inspection Team evaluated the City's compliance as it relates to the operation and maintenance (O&M) of the City's collection system, as well as the City's sanitary sewer overflow (SSO) reporting procedures. The compliance inspection consisted of the following major activities:

- Discussions with representatives from the City regarding the O&M of the collection system and wastewater treatment plants (WWTP), reporting procedures, collection system plans and manuals, and capital improvement program.
- Observation of the collection system maintenance crew activities.
- A physical inspection of the City's collection system assets.
- Examination of the City's collection system operations, maintenance, and reporting records.

The City provides sewage collection for the City of Durham through 1,067 miles of gravity sanitary sewer lines. There are no combined sewer areas in the collection system. The collection system includes 61 lift stations, and 57 miles of force mains. The collection system is composed of three service areas which discharge to the North Durham WWTP, South Durham WWTP, and the Triangle WWTP. The North Durham and South Durham WWTPs are owned and operated by the City. The Triangle WWTP is owned and operated by Durham County.

The North Durham WWTP and the South Durham WWTP are regulated under two separate National Pollutant Discharge Elimination System (NPDES) Permits (NPDES Permits). The North Durham WWTP is regulated under NPDES Permit NC0023841, and the South Durham WWTP is regulated under NPDES Permit NC0047597. In addition to these permits, the City's collection system is also regulated under the North Carolina Department of Environment and Natural Resource (NCDENR) System-Wide Wastewater Collection System Permit WQCS0005 (Collection System Permit).

This report summarizes the results of the inspection. The following personnel were involved in the inspection of the City's collection system:

City of Durham Representatives:	Don Greeley, Director
	Martin Nona, Assistant Director
	Reginald Hicks, Regulatory Compliance Superintendent
	Jim Harding, System Rehabilitation Supervisor
	Bob Gasper, Engineer
	Clif Tillman, Lift Station Supervisor
	John Dodson, Plant Superintendent
	Charles Cocker, Plant Superintendent
	Chris Hollifield, Plant Maintenance Superintendent

	Bob Slaughter, Plant Maintenance Assistant Superintendent
EPA Inspection Team:	Brad Ammons, EPA Region 4
	Dennis Sayre, EPA Region 4
	Richard Elliott, EPA Region 4
	Bill Simpson, EPA Region 4
	Cornell Gayle, EPA Region 4
	Sara Schiff, EPA Region 4
	Danny O'Connell, PG Environmental, LLC
	Pieter Beyer, PG Environmental, LLC
NC DENR:	Deborah Gore, Pretreatment, Emergency Response and Collection System Unit Supervisor
	Michael Legett, Pretreatment, Emergency Response and Collection System Unit Engineer

II. MAJOR OBSERVATIONS

A. Maintenance of Collection System

The responsibility for maintaining the City's collection system is divided into three different departments within the City's Water and Sewer Maintenance Division: the Sewer Rehabilitation Department, the Mainline Repair Department, and the Outfall Department. The O&M of the North and South Durham WWTPs as well as the City's 61 lift stations has been assigned to the Plant Engineering and Maintenance Division.

Sewer Rehabilitation Department

The Sewer Rehabilitation Department handles the bulk of the activities associated with operating and maintaining the sewer mains. It is responsible for cleaning sewer mains, inspecting sewer mains using closed circuit television (CCTV) equipment, and responding to customer complaints or other collection system emergencies not associated with failures of the City's lift stations.

The Sewer Rehabilitation Department maintains a fleet of five combination jetter/vactor trucks; however, the City currently only employs three teams to operate these trucks. Therefore two of the combination jetter/vactor trucks are currently not in use. The City Sewer Rehabilitation Department also operates three CCTV trucks that are used to visually inspect the sewer mains. The CCTV crews have been trained on the National Association of Sewer Service Companies (NASSCO) Pipeline Assessment and Certification Program.

Responding to customer complaints and collection system emergencies is handled by two quick response teams which use small jetter-only trucks. The City currently employs two such quick response teams, one

for northern Durham, and one for southern Durham. The quick response teams work a 7 a.m. to 4 p.m. shift; however, the two crews are on call outside of these times to respond to complaints or emergencies.

The activities conducted by the Sewer Rehabilitation Department are managed and tracked using the Cityworks computerized maintenance management system (CMMS). For a detailed discussion on the City's implementation of the Cityworks system please refer to the Customer Complaints section of this report.

Mainline Repair Department

The Mainline Repair Department performs basic structural repairs on the collection system. This includes point repairs and patching using 2-foot and 4-foot cured-in-place liners. The City has two cured-in-place patch repair crews which perform approximately 40 patches per month (see Figure 1). The City has estimated that it will perform approximately 600 patches in 2012.

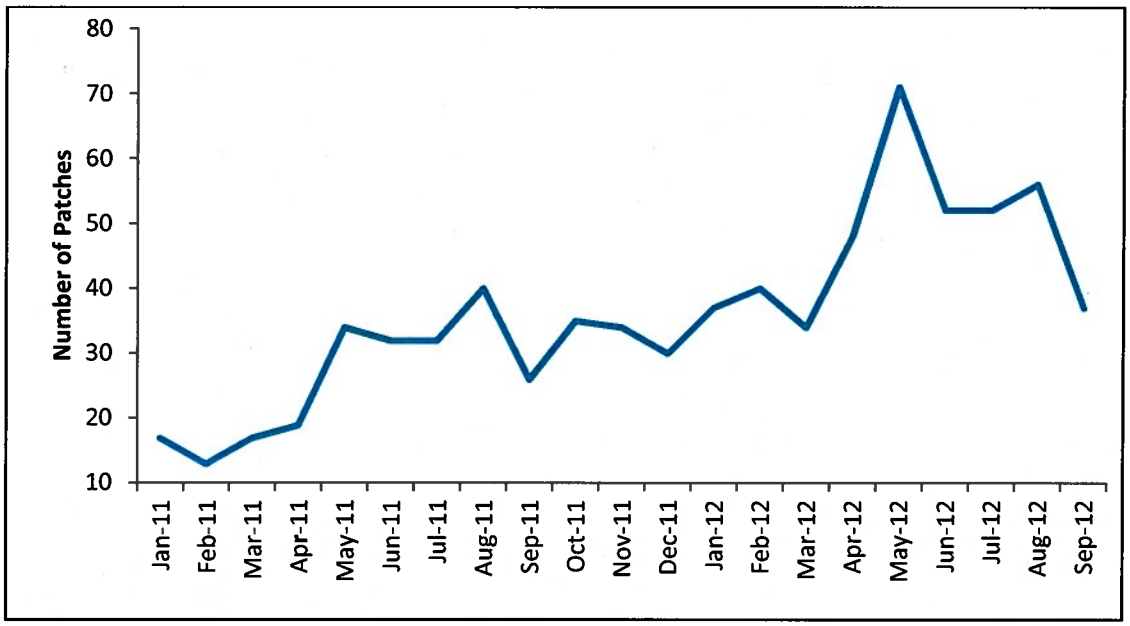

Figure 1. Number of patches performed by the City.[1]

Outfall Department

The Outfall Department performs actions similar to those of the Sewer Rehabilitation Department, except that it does so for what the City has identified as its outfall lines. The City defines an outfall sewer line as any sewer line which is outside of the right of way of a roadway. This includes City sewers which traverse private property, run along rivers, or require other specialized sewer equipment such as a tracked-cart easement jetter.

[1] Figure provided by City during inspection

B. Collection System Cleaning

Part II.8 of the Collection System Permit requires the City to clean at least 10 percent of the collection system each year. The goal of the City's Sewer Rehabilitation Department is to clean one percent of the system each month for an annual goal of 12 percent of the system. The data provided by the City, shown in Figure 2 below, indicates that the Sewer Rehabilitation Department has been able to reach this goal for the past year.

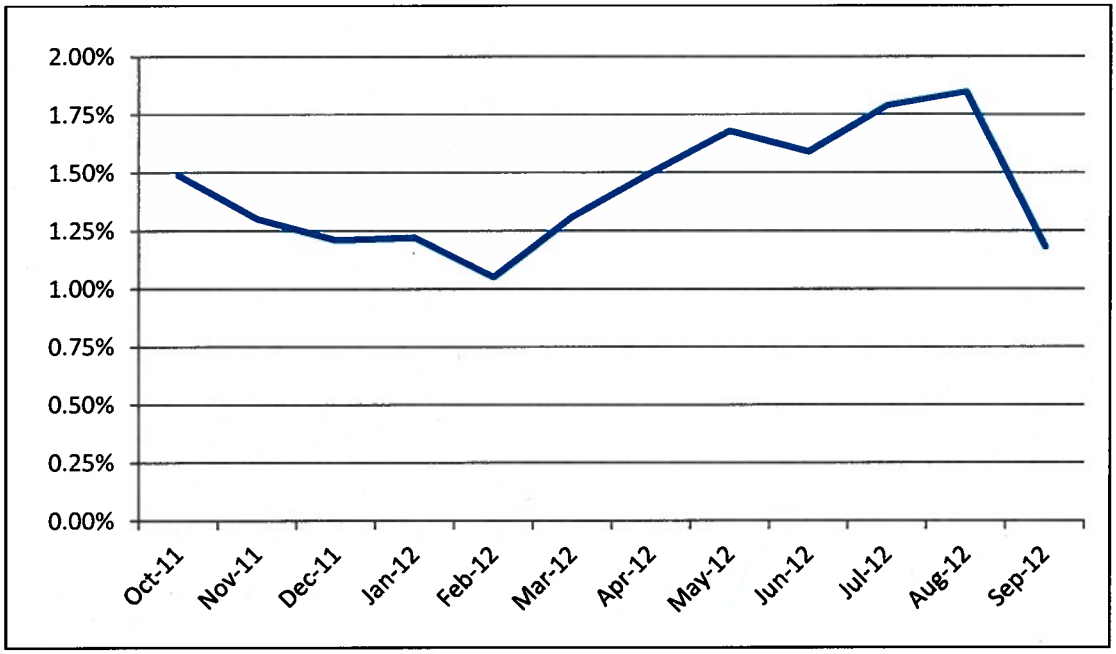

Figure 2. Percent of sewer system cleaned by City of Durham staff.

In addition to this, the City has also set a goal to inspect 10 percent of the collection system annually using CCTV equipment. The inspection program started in 2006 in the downtown Durham area and has continued in a spiral pattern from there. This pattern will be followed until all of the collection system has been inspected in 2016. After the full collection system has been inspected, the City plans on continuing the inspection program using a similar spiral approach starting in downtown Durham. A schematic of the sewer basins which have been inspected has been included as Figure 3 on the following page.

The EPA Inspection Team also inquired whether the City had established a problem area or hot-spot cleaning program. The City stated that there currently is no formal hot-spot cleaning program, but rather that the Sewer Rehabilitation Department staff used institutional knowledge to direct cleaning activities for problem areas.

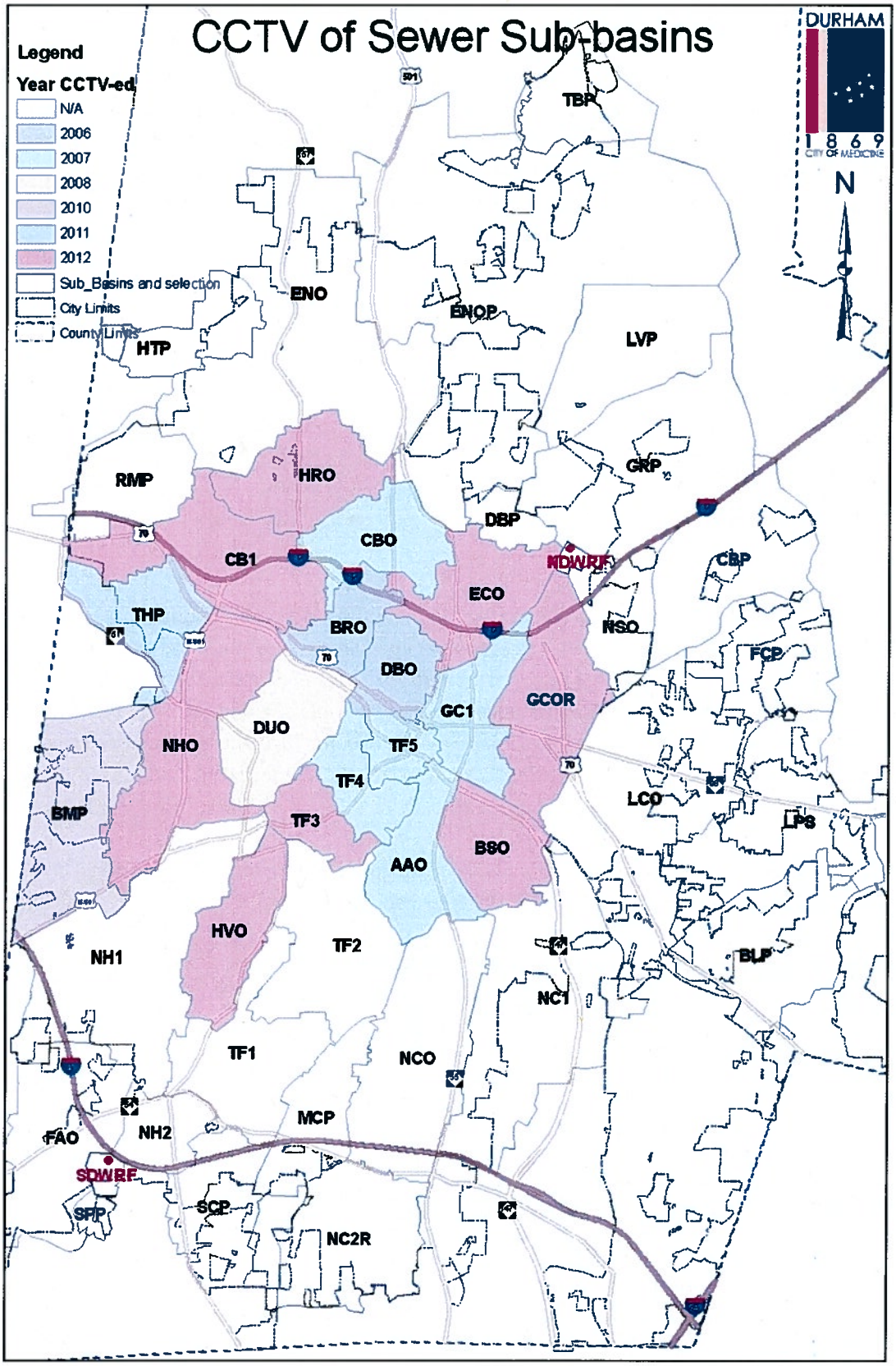

Figure 3. Schematic of sewer basins inspected by City at time of inspection.

C. Customer Complaints

Customer complaints are received at a central call center, Durham One Call, which handles complaints for all of the City's departments. Durham One Call enters the complaint details into Cityworks, assigns the complaint a service request number, and forwards the complaint to the appropriate department. Durham One Call uses a script generated by the Public Works Department to determine whether the complaint is a sewer problem, and identifies each sewer complaint using one of the following problem codes:

- Backups
- Broken/missing cover
- Channel/ditch maintenance
- Cleanout plug
- Drain/flood problem
- Driveway work
- Easement clearing
- Manhole cover off
- Manhole dumping
- Manhole overflowing
- Miscellaneous sewer
- Repair potholes
- Sewer odor
- Sewer overflow
- Sinkhole/cave in
- Storm drain maintenance
- Valve leaking

Complaints for the collection system are forwarded to the Public Works Operations Center where a water and sewer maintenance dispatcher reviews the problem code and assigns the service request to the appropriate work crew. For complaints of sewer backups or overflows, the dispatcher radios one of the two quick response teams (depending on the location of the complaint), and provides them with the location and nature of the complaint. After responding to the complaint, the quick response team fills out a hardcopy "Rodding Report" (See Appendix B) and updates the service request in the Cityworks system using a laptop that is stored in the quick response truck.

In 2011 the City received 1,537 complaints regarding the collection system. As shown in Table 1, approximately 68 percent of these complaints were for backups into buildings.

Table 1. Summary of Complaints Received by the City in 2011

Problem Code	Count	Percent of Total
Backups	1050	68.3%
Miscellaneous sewer	156	10.1%
Manhole cover off	109	7.1%
Sewer odor	101	6.6%
Manhole overflowing	63	4.1%
Easement clearing	23	1.5%
Cleanout plug	12	0.8%
Sinkhole/cave in	9	0.6%
Sewer overflow	4	0.3%
Storm drain maintenance	3	0.2%
Drain/flood problem	2	0.1%

Problem Code	Count	Percent of Total
Broken/missing cover	1	0.1%
Channel/ditch maintenance	1	0.1%
Driveway work	1	< 0.1%
Manhole dumping	1	< 0.1%
Valve leaking	1	< 0.1%
Total	1537	100.0%

The Cityworks system currently does not have a specific field to identify whether these backups were the result of a City problem or because of a private sewer lateral issue. To gather more detail on what percentage of the backup and overflow complaints were attributable to problems in the City's collection system, PG conducted a brief review of the Cityworks data for the period from April 10, 2012 to October 25, 2012. PG reviewed the comments provided by the quick response teams regarding the nature and location of the problem causing the backup or overflow. There were 535 complaints logged during the period reviewed, which can be grouped into three broad categories (percentages are approximate):

- 25 percent were found to be the result of a City problem
- 22 percent were identified as private issues.
- 53 percent could not be categorized due to insufficient information.

The high percentage of complaints that could not be categorized was largely due to the limited amount of variables that are recorded by the quick response teams.

D. Collection System Blockages

The collection system experiences a significant number of blockages. Over the past six years, the City has cleared an average of 706 blockages per year. The City has also estimated that 50 to 80 percent of the blockages are caused by fats, oils, and grease (FOG)[2], with root intrusion being the second largest problem. (More information on the FOG program can be found in Part H of this section.) Table 2 provides a summary of the number of blockages that the City has responded to over the past six years.

Table 2. Number of Blockages Cleared by the City[2]

Fiscal Year	Number of Blockages Reported
2010 -2011	700
2009- 2010	775
2008- 2009	695
2007- 2008	606
2006- 2007	725
2005- 2006	735
Average number	706

[2] City of Durham Annual Sanitary Sewer System Reports for FY 2005 to 2011

It should be noted, however, that the City takes ownership of service laterals from the sewer main to the serviced property's easement line, which is approximately 12 feet from the roadside or curb. Because of this, many homeowners have two cleanouts, one to access the City owned portion of the service lateral, and a second lateral closer to the building to access the remainder of the service lateral.

The City does not currently have a tracking mechanism in place to readily determine the percentage of blockages in laterals versus the percentage in sewer mains; however, based on discussions with the quick response teams and a brief review of the Cityworks data, it appears that a majority of the blockages shown in Table 2 occurred in the City-owned portion of the service laterals.

E. Sanitary Sewer Overflows

Part II.B.2 of the NPDES Permits requires the City minimize or prevent discharges, and Part II.C.2 of the NPDES Permits requires the City operate and maintain all components of the system to achieve compliance with the conditions of the NPDES Permits. The Collection System Permit states at Part I.2 that the collection system must be "effectively managed, maintained, and operated at all times so that there is no SSO to land or surface waters, nor any contamination of groundwater." The NPDES Permits state at Part II.E.6.a that the City report all instances of noncompliance, including SSOs, that potentially threatens public health or the environment to NCDENR. The Collection System Permit states at Part IV.2 that all SSOs to surface waters must be reported; however, SSOs to land must be reported only if the volume of wastewater that overflowed was greater than 1,000 gallons.

Over the past six years, the City has, on average, reported 52 SSOs per year to NC DENR (see Table 3).

Table 3. Number of SSOs Reported to the NC DENR

Year	Number of SSOs Reported
FY 2010 -2011	54
FY 2009- 2010	57
FY 2008- 2009	55
FY 2007- 2008	76
FY 2006- 2007	41
FY 2005- 2006	34
Average	52

Due to the 1,000 gallon reporting threshold for SSOs to land, the backups discussed in the previous section may have resulted in several hundred additional smaller SSOs per year that were not reported. Specifically, the quick response team stated that backups into buildings are typically below the 1,000 gallon threshold and are therefore not reported.

F. Pump Stations

Pump stations are maintained by pump station maintenance crews that operate within the WWTP O&M division. All pump stations have been equipped with basic alarms such as wet well high and low level

alarms, and pump status alarms. The pump stations are visited on a weekly basis, except for the Eno and Lick pump stations which are visited daily due to their size.

The EPA Inspection team observed some moderate grease accumulation in some of the pump station wet wells, and noted some maintenance deficiencies with the pump station equipment. Specifically, the flow meter re-calibration period had expired at several pump stations; the wet well ventilation system at the Eno Pump Station had been destroyed during Hurricane Fran in 1996 and still had not been repaired; and the pump station valves are not exercised on a regular basis.

The City also recently completed a pump station risk assessment in which it determined that more than half of the pump stations are over 20 years old and may be approaching the end of their usable life. The risk assessment noted that the City's oldest pump stations showed signs of significant deficiencies due to their corrosive environments. Additionally the risk assessment noted that "approximately one quarter of the pump stations evaluated had screenings related issues, including high maintenance requirements, and non-functioning or missing bar screens or basket screens."

G. Wet Weather Capacity

The EPA Inspection team inspected a sewer main which runs parallel to the Eno River at West Point on the Eno Park in northern Durham. The manholes for the sewer main showed signs of recent surcharging up to and over the manhole covers (see Photographs 28-30). The City's maintenance staff stated that the sewer main has been known to overflow in the past during wet weather events. PG reviewed the Cityworks database for overflows reported at this location and found two customer complaints relating to this sewer main (see Table 4). It should be noted that the sewer main is in a park along a walking trail and not in a populated area. As such, overflows during wet weather would typically go unnoticed unless there are people walking the path during the wet weather event.

Table 4. Customer Complaints for Sewer Main in West Point on the Eno Park

By MESCHKO, MELINDA: 10/4/2012 1:40:00 PM SEWAGE LEAKING OUT OF MANHOLES "VENTING" FOR A CPL MONTHS @ WEST POINT ON THE ENO NEARDAM-@HEAD OF DAM MANHOLE 50' FROM DAM. MANHOLE CLOSEST TO DAM (STRONG SEWAGE ODOR AS WELL) WHEN IT RAINS HEAVILY IT IS COMING OUT. RIGHT NOW A CONTINUAL FLOW OF SEWAGE INTO THE RIVER. 1 MILE ABOVE H2O SUPPLY. ANOTHER ONE UP THE RIVER THAT VENTS AS WELL. PLEASE CALL RESIDENT, IF NEED ADDT'L INFO.
By MESCHKO, MELINDA: 10/24/2012 10:00:02 AM WEST POINT ON THE ENO. VERY STRONG SEWER ODOR. 4TH GRADERS ON FIELD TRIP HOLDING THEIR NOSES. SEWER MANHOLE @ THE DAM. 200 FT STRETCH OF RIVER SMELLS TERRIBLY. MUST @ LEAST NEED FLUSHING. PUBLIC HEALTH HAZARD.

The City stated during the inspection that it had no known wet weather capacity problems in the collection system; however, there appears to be a concern with at least this section of the collection system. It is unclear to the EPA Inspection Team if there are additional wet weather capacity issues.

H. FOG Program

The City has estimated that approximately 50 to 80 percent of its collection system blockages are caused by FOG. To combat this problem, the City uses radio and television advertisements to educate the public about proper FOG disposal. The City's FOG program is administered by its Industrial Pretreatment Program. At the time of the inspection, the City stated that it had allocated three full-time employee positions to the FOG program (1 manager plus 2 field employees); however, only the manager position was filled at the time of the inspection.

I. High Priority Line Inspection

The City has identified approximately 650 high priority lines. The lines are inspected twice each year, by the City's engineering department, following the City's semi-annual easement mowing program. The City was in the process of wrapping up an inspection cycle during the inspection and stated that no leaks or structural deficiencies were found.

J. O&M Manuals

When the City discussed its O&M programs during the inspection, the EPA Inspection Team inquired whether the City had developed any O&M plans, manuals, or standard operating procedures (SOPs) to support the programs. The City provided the EPA Inspection Team with some limited SOPs for responding to overflows and operating the wastewater treatment plants; however, the City stated that it did not have a comprehensive plan for operating and maintaining the collection system or for responding to wet weather events.

III. ASSESSMENT OF COMPLIANCE WITH PERMIT REQUIREMENTS

The EPA Inspection Team evaluated the City's compliance as it relates to the operation and maintenance of the City's collection system, as well as recordkeeping and reporting procedures. It should be noted that in addition to the conditions and limitations in the NPDES Permits and the Collection System Permit, the City is also required to adhere to the requirements of the North Carolina Administrative Code (NCAC). The EPA Inspection Team's findings are summarized in Table 5 below.

Table 5. Findings of Potential Noncompliance

Requirement	Permit/Regulatory References
Finding 1. Failure to manage, maintain, and operate the collection system to prevent SSOs.	Part II.B.2 & C.2 of NPDES Permits Part I.2 of Collection System Permit
Finding 2. Failure to adequately operate and maintain the pump stations.	Part II.B.2 & C.2 of NPDES Permits Part II.4 of Collection System Permit

A. Finding 1. Failure to Manage, Maintain, and Operate the Collection System to Prevent SSOs

The City has failed to manage, maintain, and operate the collection system to prevent SSOs as required by Part II.B.2 and Part II.C.2 of the NPDES Permits, as well as Part I.2 of the Collection System Permit. Specifically, Part II.B.2 of the NPDES Permits require:

> *The Permittee shall take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit with a reasonable likelihood of adversely affecting human health or the environment.*

Part II.C.2 of the NPDES Permits require:

> *The Permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the Permittee to install and operate backup or auxiliary facilities only when necessary to achieve compliance with the conditions of this permit.*

Part I.2 the Collection System Permit requires:

> *The wastewater collection system shall be effectively managed, maintained and operated at all times so that there is no SSO to land or surface waters, nor any contamination of groundwater.*

As discussed in section I.E of this report (Sanitary Sewer Overflows), the City has reported, on average, 52 SSOs per year over the past six years. Additionally, there may be several hundred additional SSOs in the form of building backups and backups to land which are not reported because they are below the 1,000 gallon reporting limit for SSOs that do not reach surface waters.

Additionally the EPA Inspection Team observed that the City did not clean up building backup SSOs during the inspection. Specifically, the City did not clean up the SSO at 1702 Forest Road after clearing the blockage which caused the overflow. Instead, the City crews instructed the homeowner that he should clean up the area and disinfect it with bleach.

As a result of the inspection, the EPA Inspection team has concluded that the City has failed to manage, maintain, and operate the collection system to prevent SSOs as required by Part II.B.2 and Part II.C.2 of the NPDES Permits, as well as by Part I.2 of the Collection System Permit.

B. Finding 2. Failure to Adequately Operate and Maintain the Pump Stations.

The City has failed to adequately operate and maintain the pump stations as required by Part II.B.2 and Part II.C.2 of the NPDES Permits, as well as Part II.4 of the Collection System Permit. Specifically, Part II.4 of the Permit requires:

> *The Permittee shall develop and implement a routine pump station inspection and maintenance program, which shall include, but not be limited to, the following maintenance activities:*
>
> *a. Cleaning and removing debris from the pump station structure, outside perimeter, and wet well;*
> *b. Inspecting and exercising all valves;*
> *c. Inspecting an lubricating pumps and other mechanical equipment according to the manufacturer's recommendations; and*
> *d. Verifying the proper operation of the alarms, telemetry system and auxiliary equipment.*

As discussed in section I.F of this report (Pump Stations), the EPA Inspection team observed some moderate grease accumulation in some of the pump station wet wells and noted some maintenance deficiencies with the pump station equipment. Specifically, the flow meter re-calibration period had expired at several pump stations; the wet well ventilation system at the Eno Pump Station had been destroyed during Hurricane Fran in 1996 and still had not been repaired; and the pump station valves are not exercised on a regular basis.

The City also recently completed a pump station risk assessment in which it determined that more than half of the pump stations are over 20 years old and may be approaching the end of their usable life. The risk assessment noted that the City's oldest pump stations showed signs of significant deficiencies due their corrosive environments. Additionally the risk assessment noted that "approximately one quarter of the pump stations evaluated had screenings related issues, including high maintenance requirements, and non-functioning or missing bar screens or basket screens."

As a result, the City has failed to adequately operate and maintain the pump stations as required by Part II.B.2 and Part II.C.2 of the NPDES Permits, as well as Part II.4 of the Collection System Permit.

IV. RECOMMENDED REFERENCE MATERIALS

The EPA Inspection Team discussed the aforementioned findings with the City and emphasized the need for developing a comprehensive O&M plan for the collection system. The plan should include structured and written standard operating procedures (SOPs) for both preventive and reactive components of sewer maintenance (including cleaning) performed by the City.

The SOPs should include detailed step-by-step procedures for conducting the maintenance and cleaning activities including, but not limited to,

- Pipe maintenance activities such as preventive maintenance, cleaning, CCTV evaluations, and blockage removal;
- Types of equipment to be used (i.e., "tiger tails," nozzles, screens/rakes, etc.);
- Guidelines and/or reference tables for appropriate jetting pressures and flows based on the type of jetting activity, type of pipe, size of pipe, age of pipe, and known condition of pipe; and
- Formal documentation of pipe conditions, materials removed during cleaning, and other findings for review by managerial staff.
- Considerations for succession planning to ensure a diverse workforce with a full spectrum of skill-sets.

While the City cleaning crews did demonstrate considerable institutional knowledge during the inspection, the operation of high pressure sewer equipment without formal training and without SOPs can create serious safety issues and may significantly damage the structural integrity of the sewer pipe. Reference materials to support the development of the SOPs are available from various sources (equipment manufacturers, equipment vendors, professional associations, etc.), including references such as the National Association of Sewer Service Companies' *Jetter Code of Practice* (http://nassco.org/publications/p_techman.html) which provides guidelines for the proper operation of sewer jetter equipment.

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APPENDIX A – Asset-specific Observations

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Asset-specific Observations

Asset	Date and Time of Inspection	Photo Log Reference	Observations
North Side WWTP	10/23/12 2:15 p.m.	No Photos Taken	The EPA Inspection Team discussed wet weather operations with the treatment plant supervisor and determined that only limited SOPs existed for wet weather conditions.
Glenview Pump Station	10/23/12 3:00 p.m.	1-4	The pump station includes a wet well with two submersible pumps. There was minimal grease accumulation in the wet well. The pump station has been equipped with a bioxide dosing system for odor control, a backup generator, and a telemetry system which monitors the wet well, pumps, and backup generator.
Fletcher Chapel Pump Station	10/23/12 3:30 p.m.	5-8	The pump station includes a wet well with two submersible pumps. The wet well could not be observed due to confined space entry. The pump station has been equipped with a bioxide dosing system for odor control, a backup generator, and a telemetry system which monitors the wet well, pumps, and backup generator. There was a significant accumulation of solids removed from the bar screens on the influent side of the pump station.
Lick Creek Pump Station	10/23/12 4:00 p.m.	9-13	The pump station includes a wet well with three pumps. The pump station has been equipped with a bioxide dosing system for odor control, a backup generator, and a telemetry system. The pump station used to be a satellite treatment plant and therefore also includes two clarifiers which are out of service.
Eno Pump Station	10/24/12 8:45 a.m.	14-16	The pump station includes a wet well and a dry well with three pumps. The pump station has been equipped with a bioxide dosing system for odor control, a backup generator, and a telemetry system. The ventilation system for the pump station was destroyed during hurricane Fran in 1996 and had not yet been repaired. The wet well was not observed due to confined space entry.
Treyburn 3 Pump Station	10/24/12 9:30 a.m.	17-20	The pump station includes a wet well and two pumps. There was a minor accumulation of grease in the wet well. The pump station has been equipped with a bioxide dosing system for odor control, a backup generator, and a telemetry system which monitors the wet well, pumps, and backup generator.

Asset	Date and Time of Inspection	Photo Log Reference	Observations
Wiley Avenue and Barry Street Sewer Cleaning	10/24/12 10:00 a.m.	21-22	The City crews cleaned a segment of vitrified clay pipe. The cleaning crew ran the jetter out at a pressure of 1,000 psi and pulled it back at a pressure of 1,800 psi with a flow of 80 gallons per minute. After an initial jetting the cleaning crew typically attaches either a root cutter or grease cleaning head to perform a second cleaning pass. After the cleaning the line was inspected via CCTV to confirm the line's structural integrity.
Aerial High Priority Line at Northgate Dog Park	10/24/12 11:00 a.m.	23	The aerial line crosses Ellerbe Creek north of the Northgate Dog Park. No structural deficiencies were observed, and no leaking was visible.
SSO at 1702 Forest Road	10/24/12 11:50 a.m.	24-25	A blockage in the City portion of a residential lateral caused a backup onto the front yard of the residence. The City crews cleared the blockage but did not clean up the spilled wastewater and debris. The overflow was approximately 5 gallons in size.
Charlestown Road Sewer Surcharge	10/24/12 2:00 p.m.	26-27	There was a blockage in a sewer line which caused a surcharged manhole. The City cleaning crew ran the jetter out at 3,000 psi and pulled it back at 4,000 psi. There were rags wrapped around the nozzle when it was pulled out of the sewer.
West Point on the Eno Park	10/25/12 9:30 a.m.	28-34	The EPA Inspection Team inspected a sewer line that runs parallel to the Eno River in the West Point on the Eno Park. The City crews accompanying the EPA Inspection Team stated that the line frequently surcharges and that the crews had been there several times previously for overflows from the manholes on the sewer line. The manholes that were inspected during the inspection all showed signs of recent and/or frequent surcharging.

APPENDIX B – Sample Rodding Report

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Department of Water Management W/S Maintenance Division

Sanitary Sewer Rehabilitation Program

Daily Operations Report

Date 8-1-12

Street/Easement Hope valley o/f ( ) EMR ( ) FLW (✓) RTN ( ) SSE ( ) SWS ( )
Basin — Subsystem 24-C Monitor HV0 ( ) CHK ( ) ROD (✓) JET ( ) MTV ( ) MOW ( )
From Manhole 26871 To Manhole 09912 ( ) LAT ( ) MNL (✓) OUT ( ) STM ( ) FAC ( )
Length 300 Diameter 15 Type Pipe RCP ( ) CLR ( ) LTE ( ) MOD (✓) SVR ( ) BLK ( )
RS # _____ WO # 460775 SR # _____ ( ) RTS ( ) GRE (✓) GVL ( ) MUD ( ) BKP ( )
Comment :

Street/Easement Hope valley o/f ( ) EMR ( ) FLW (✓) RTN ( ) SSE ( ) SWS ( )
Basin — Subsystem 24-C Monitor HV0 ( ) CHK ( ) ROD (✓) JET ( ) MTV ( ) MOW ( )
From Manhole 09912 To Manhole 09913 ( ) LAT ( ) MNL (✓) OUT ( ) STM ( ) FAC ( )
Length 258 Diameter 15 Type Pipe RCP ( ) CLR ( ) LTE ( ) MOD (✓) SVR ( ) BLK ( )
RS # _____ WO # 460775 SR # _____ ( ) RTS ( ) GRE (✓) GVL ( ) MUD ( ) BKP ( )
Comment:

Street/Easement Hope valley o/f ( ) EMR ( ) FLW (✓) RTN ( ) SSE ( ) SWS ( )
Basin — Subsystem 24-C Monitor HV0 ( ) CHK ( ) ROD (✓) JET ( ) MTV ( ) MOW ( )
From Manhole 09913 To Manhole 09898 ( ) LAT ( ) MNL (✓) OUT ( ) STM ( ) FAC ( )
Length 600 Diameter 15 Type Pipe RCP ( ) CLR ( ) LTE (✓) MOD ( ) SVR ( ) BLK ( )
RS # _____ WO # 460775 SR # _____ ( ) RTS ( ) GRE (✓) GVL ( ) MUD ( ) BKP ( )
Comment:

Street/Easement _____ ( ) EMR ( ) FLW ( ) RTN ( ) SSE ( ) SWS ( )
Basin _____ Subsystem _____ Monitor _____ ( ) CHK ( ) ROD ( ) JET ( ) MTV ( ) MOW ( )
From Manhole _____ To Manhole _____ ( ) LAT ( ) MNL ( ) OUT ( ) STM ( ) FAC ( )
Length _____ Diameter _____ Type Pipe _____ ( ) CLR ( ) LTE ( ) MOD ( ) SVR ( ) BLK ( )
RS # _____ WO # _____ SR # _____ ( ) RTS ( ) GRE ( ) GVL ( ) MUD ( ) BKP ( )
Comment:

Street/Easement _____ ( ) EMR ( ) FLW ( ) RTN ( ) SSE ( ) SWS ( )
Basin _____ Subsystem _____ Monitor _____ ( ) CHK ( ) ROD ( ) JET ( ) MTV ( ) MOW ( )
From Manhole _____ To Manhole _____ ( ) LAT ( ) MNL ( ) OUT ( ) STM ( ) FAC ( )
Length _____ Diameter _____ Type Pipe _____ ( ) CLR ( ) LTE ( ) MOD ( ) SVR ( ) BLK ( )
RS # _____ WO # _____ SR # _____ ( ) RTS ( ) GRE ( ) GVL ( ) MUD ( ) BKP ( )
Comment:

Vehicle # 46309 *Supervisor* C. Dorsey

Department of Public Works • Engineering • 101 City Hall Plaza • Durham • NC 27701 • Fax 919 560 4316 • Phone 919 560 4326

SANITARY SEWER SYSTEM COMPLIANCE INSPECTION

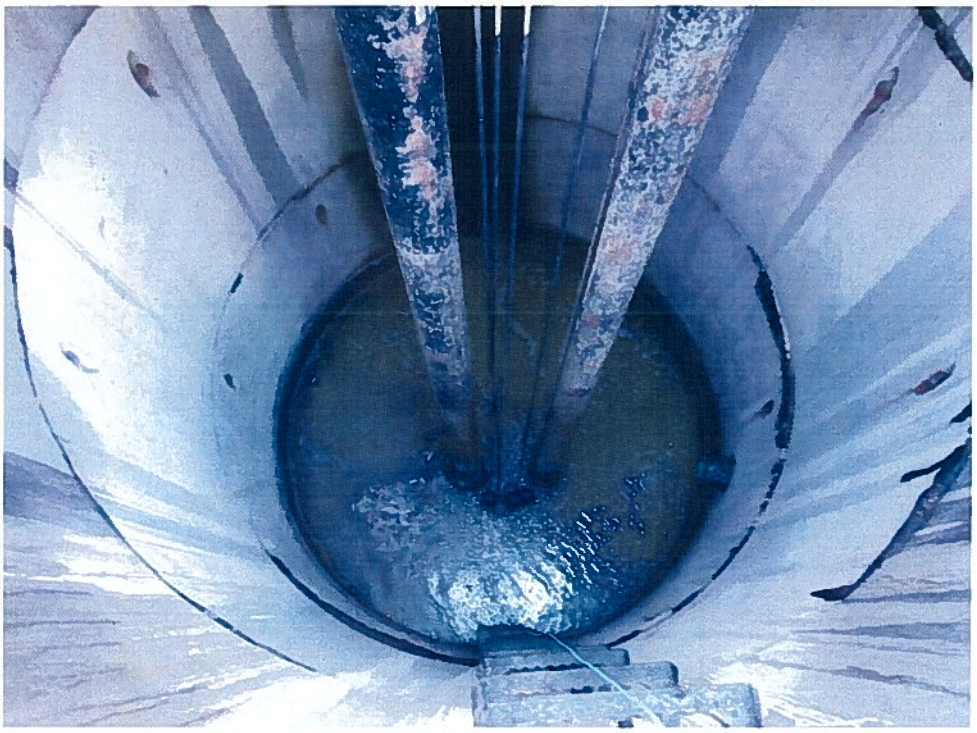
CITY OF DURHAM, NORTH CAROLINA

Photograph Log

Photograph 1. **Glenview Pump Station – View of pump station identification sign.**

Photograph 2. **Glenview Pump Station – View of backup generator and bioxide storage tank.**

Photograph 3. Glenview Pump Station – View of pump station telemetry system.



Photograph 4. Glenview Pump Station – View of pump station wet well.

Photograph 5. Fletcher Chapel Pump Station – View of pump station identification sign.

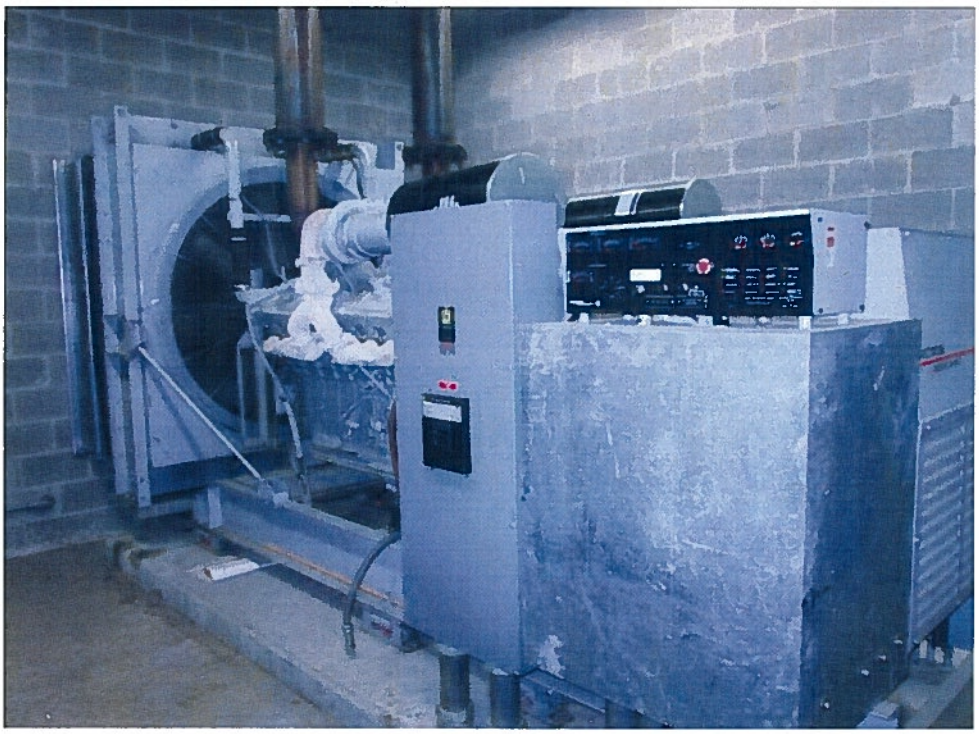
Photograph 6. Fletcher Chapel Pump Station – View of pump station backup generator.

Photograph 7. Fletcher Chapel Pump Station – View of solids from pump station screening.

Photograph 8. Fletcher Chapel Pump Station – View of pump station.

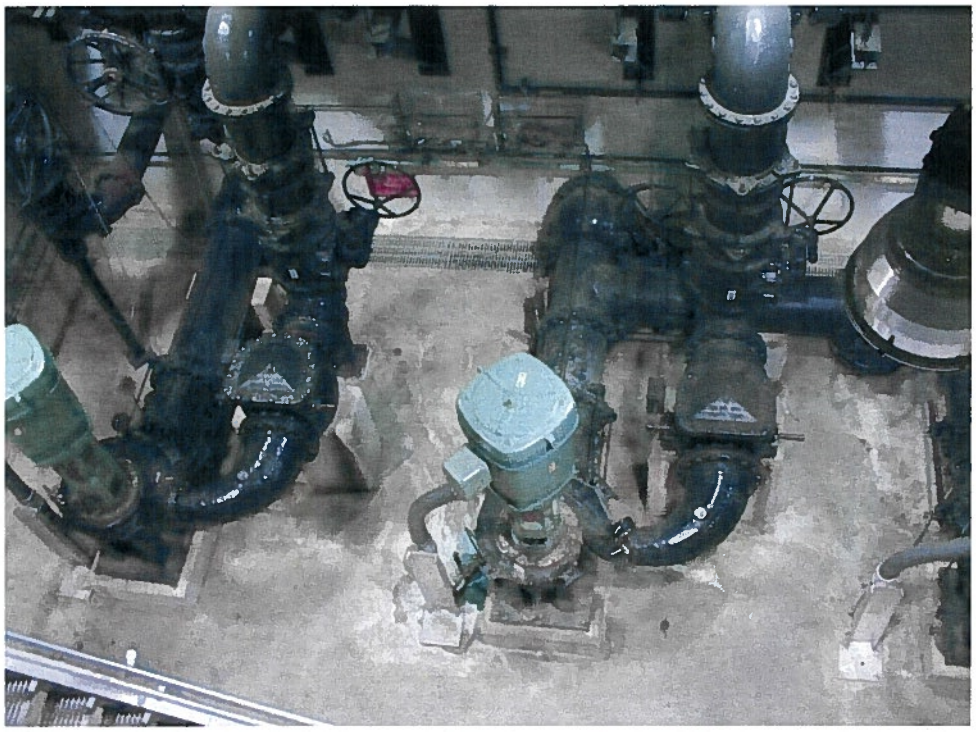
Photograph 9. Lick Creek Pump Station – View of bioxide dosing system.

Photograph 10. Lick Creek Pump Station – View of inactive clarifiers.

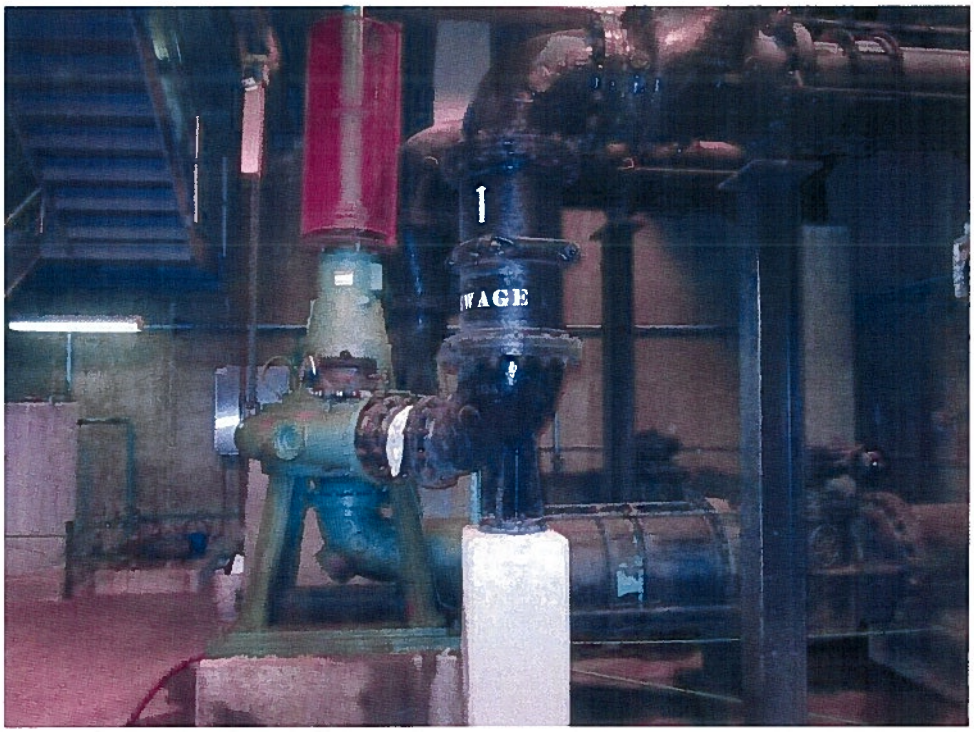


Photograph 11. Lick Creek Pump Station – View of backup generators.

Photograph 12. Lick Creek Pump Station – View of Parshall flume in wet well.

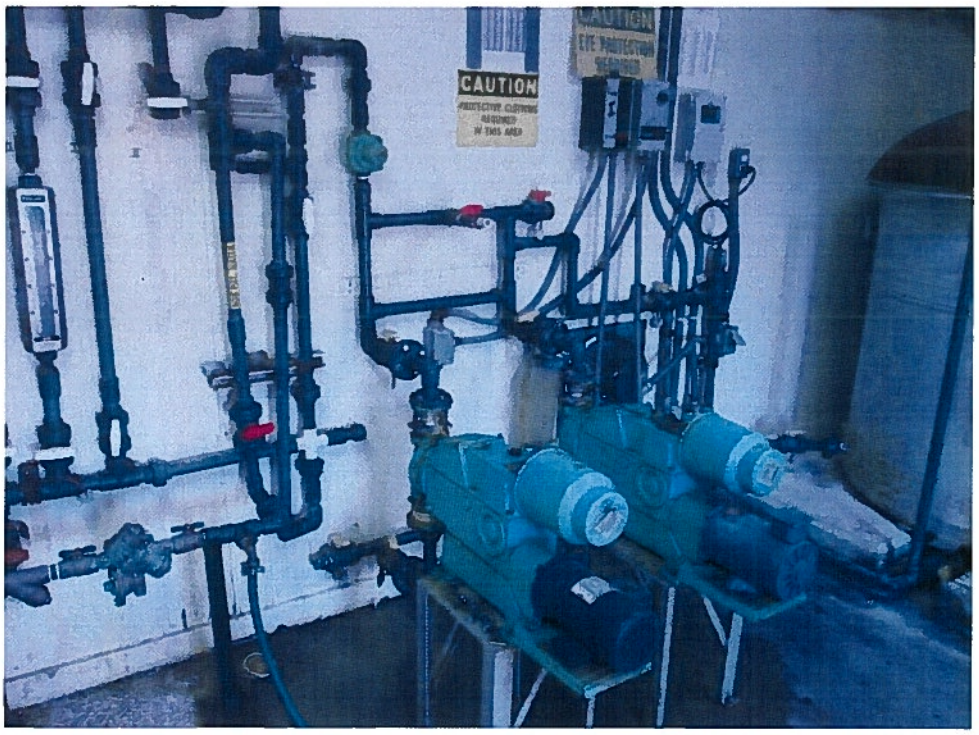


Photograph 13. Lick Creek Pump Station – View of pumps in dry well.



Photograph 14. Eno Pump Station – View of one of the three pumps in the dry well.

Photograph 15. Eno Pump Station – View of two of the three pump motors.



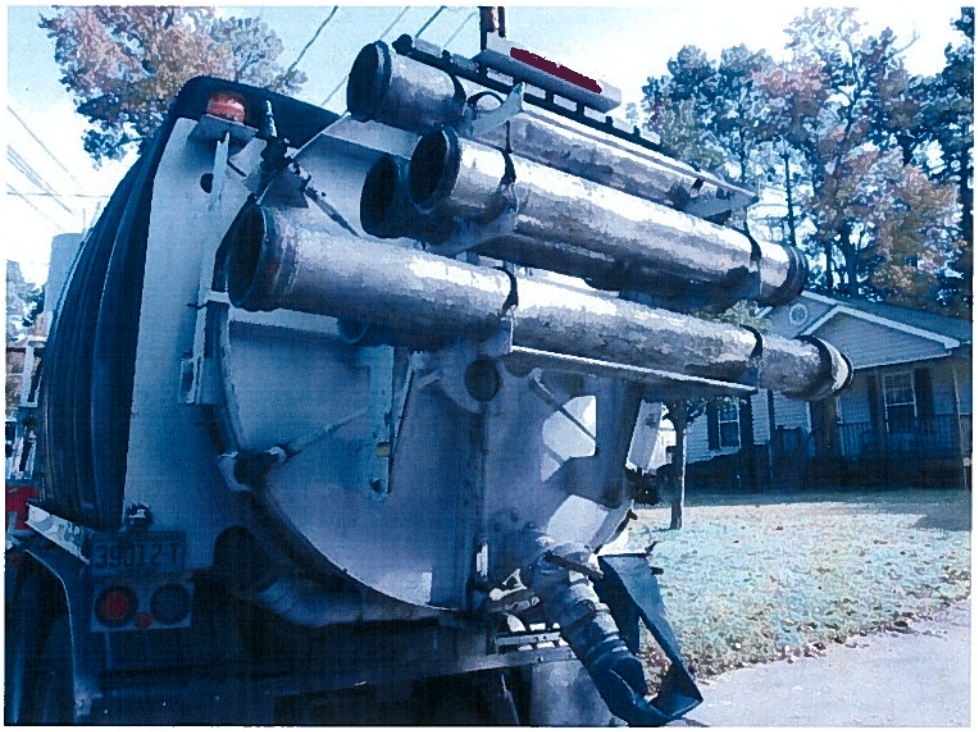
Photograph 16. Eno Pump Station – View of bioxide dosing system.

Photograph 17. Treyburn 3 Pump Station – View of pump station identification sign.

Photograph 18. Treyburn 3 Pump Station – View of pump station wet well and access hatch to the dry well.

Photograph 19. Treyburn 3 Pump Station – View of pump station wet well.

Photograph 20. Treyburn 3 Pump Station – View of pump station dry well and one of the two pumps.



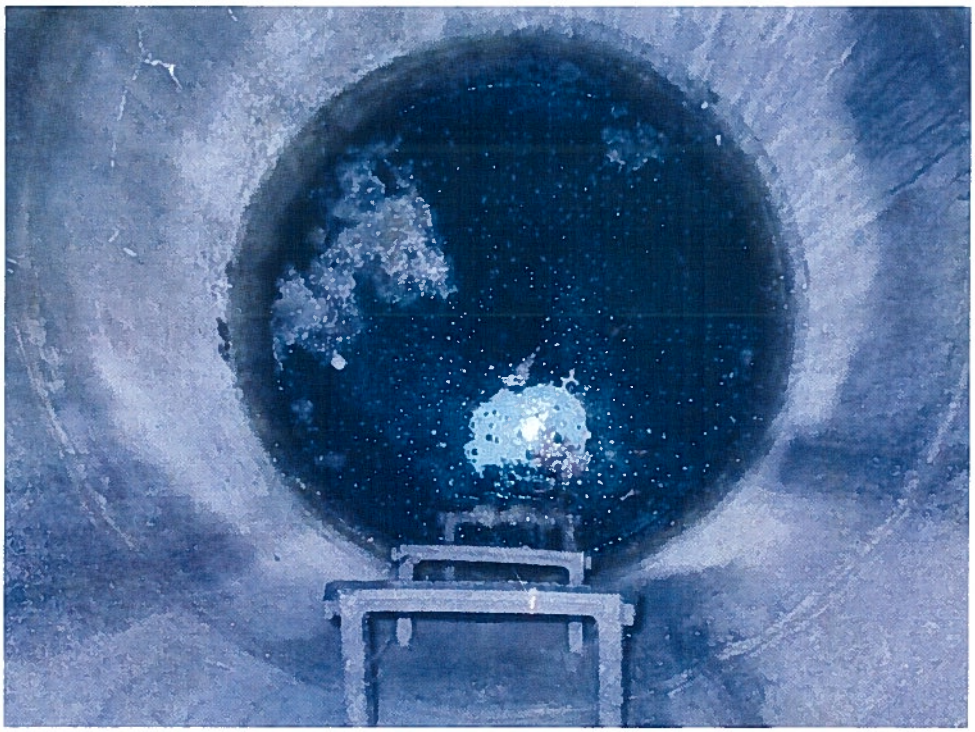
Photograph 21. **Wiley Avenue and Barry Street Sewer Cleaning – View of jetter/vactor combination truck.**

Photograph 22. **Wiley Avenue and Barry Street Sewer Cleaning – View of sewer line after cleaning.**

Photograph 23. High Priority Line – View of aerial sewer line at Northgate Dog Park.

Photograph 24. 1702 Forest Road – View of overflowed sewage at residential building.

Photograph 25. 1702 Forest Road – View of city cleanout used to clear blockage.



Photograph 26. Charlestown Road Sewer Surcharge - View of surcharged manhole.

Photograph 27. **Charlestown Road Sewer Surcharge - View of material removed from sewer that was causing the surcharge.**

Photograph 28. **West Point on the Eno Park – View of manhole showing evidence of surcharging. Note the manhole is approximately 20 feet from the Eno River.**

Photograph 29. **West Point on the Eno Park – View of manhole shown in Photograph 28 after removal of the manhole cover. Note the wastewater debris accumulated in the manhole insert.**

Photograph 30. **West Point on the Eno Park – View of manhole shown in Photograph 28 after removal of the odor control insert. Note the accumulation of debris on the top ladder rung indicating frequent surcharging.**

Photograph 31. **West Point on the Eno Park – View of additional manhole approximately 50 feet from the Eno River.**

Photograph 32. **West Point on the Eno Park – View of manhole shown in Photograph 31 after removing manhole cover. Note the accumulation of debris on the top ladder rung indicating surcharging.**

Photograph 33. **West Point on the Eno Park – View of additional manhole approximately 40 feet from the Eno River.**

Photograph 34. **West Point on the Eno Park – View of manhole shown in Photograph 33 after removing manhole cover. Note the accumulation of debris on the top ladder rung indicating surcharging.**